REMARKS

The specification has been amended in order to correct typographical, grammatical and idiomatic errors contained therein. No new matter has been added.

In order to expedite the prosecution of the present application, the subject matter of Claims 1, 5, 8 and 9 have been combined and presented as newly added Claim 16. Newly added Claim 17 contains the subject matter of originally presented Claim 2 and newly added Claim 18 contains the subject matter of originally presented Claim 3. Accordingly, Claims 1-3, 5, 8 and 9 have been canceled. No new matter ha been added.

The presently claimed invention is directed to an oxide superconducting wire composed of a metal substrate, an intermediate layer vapor-deposited by ion beam assisted deposition on the metal substrate, a cesium oxide cap layer formed by post-layer deposition on the intermediate layer and an oxide superconducting film formed on the cap layer. The thickness of the intermediate layer is no more than 1,000 nm, the thickness of the cap layer is at least 50 nm, the orientation of the intermediate layer is at least 10° and the orientation of the cap layer is no more than 10°C.

As is well known, in order to achieve an oxide superconducting film having a high critical current density, it is required that the film have a high crystal orientation. In order to achieve this purpose, an ion beam assisted deposited intermediate layer is typically formed between the metal substrate and an oxide superconducting layer. However, in order to provide the ion beam assisted deposited intermediate layer with a suitable thickness for providing a sufficient orientation to the oxide superconducting film to achieve a desired critical current density, a considerable amount of time is required due to the low formation rate of the ion beam assisted deposited intermediate layer.

The present invention overcomes the problems associated with the prior art by forming the cesium oxide cap layer on

the ion beam assisted deposited intermediate layer by pulsed laser deposition. The present invention enables the formation of an oxide superconducting wire having a good orientation and a highly increased critical current density in a shortened fabrication time by forming the cesium oxide cap layer by pulse laser deposition, which enables a rapid formation rate, on the intermediate layer vapor-deposited by ion beam assisted deposition. Since the ion beam assisted deposited intermediate layer does not have to have a thickness exceeding 1,000 nanometers, the processing time for the formation thereof is greatly shortened and the time needed for the production of the superconducting wire is greatly lowered.

In the oxide superconducting wire of the present invention, even if the ion beam assisted deposited intermediate layer is made thinner, if the pulsed laser deposited cesium oxide cap layer is made thicker, a superconducting film having a good orientation will be obtained. Although the cesium oxide layer can be provided on the ion beam assisted deposited intermediate layer by sputtering, pulsed layer deposition allows the cesium oxide layer to be formed faster and, due to the higher formation rate, the cesium oxide layer can be easily made much thicker in a shorter period of time, which results in improving the productivity of the product oxide superconducting wire. It is respectfully submitted that the Honjo et al reference does not disclose the presently claimed invention.

The Honjo et al patent application discloses a tape-formed oxide superconductor comprising a tape-formed metal substrate on non-magnetism or weak magnetism and high strength, a first intermediate layer where particles generated from a target are deposited on the metal substrate together with irradiation of ions from an inclined direction to the metal substrate, a second intermediate layer comprising cesium oxide or yttrium oxide and a superconducting layer formed thereon by a coating of metalorganic salts containing fluorine followed by a thermal decomposition. As shown by the Examples

in Honjo et al, this reference contemplates the formation of the cesium oxide cap layer on the ion beam assisted deposited intermediate layer by sputtering. In addition to not disclosing the formation of the second intermediate layer by pulsed laser deposition, Honjo et al also has no disclosure with respect to the combination of an ion beam assisted deposition first intermediate layer having an orientation of at least 10° and a pulsed laser deposition second intermediate layer having an orientation of no more than 10°. Therefore, Applicants respectfully submit that Honjo et al not only does not anticipate the presently claimed invention under 35 USC 102, given the unexpected advantages associated with the present invention, any showing of prima facie obviousness under 35 USC 103 has been rebutted.

On pages 12-19 of the present specification, Examples of the present invention and Comparative Examples are presented. Figures 4-8 of the present specification show the results of these Examples and Comparative Examples. As illustrated in these figures, the present invention provides superior results in that they have higher current density and exhibited more usefulness and practical application than the Comparative Examples. This is clearly unexpected in light of the prior art cited by the Examiner and establishes the patentability of the presently claimed invention thereover. Moreover, given the high film formation rate associated with the present invention, the economic effects alone are more than sufficient to establish the patentability of the presently claimed invention.

The Examiner is respectfully requested to reconsider the present application and to pass it to issue.

Respectfully submitted,

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Encl: Priority Document and Transmittal therefor
Information Disclosure Statement including
Japanese Office Action, Form PTO-1449 and one copy
of each reference listed thereon
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